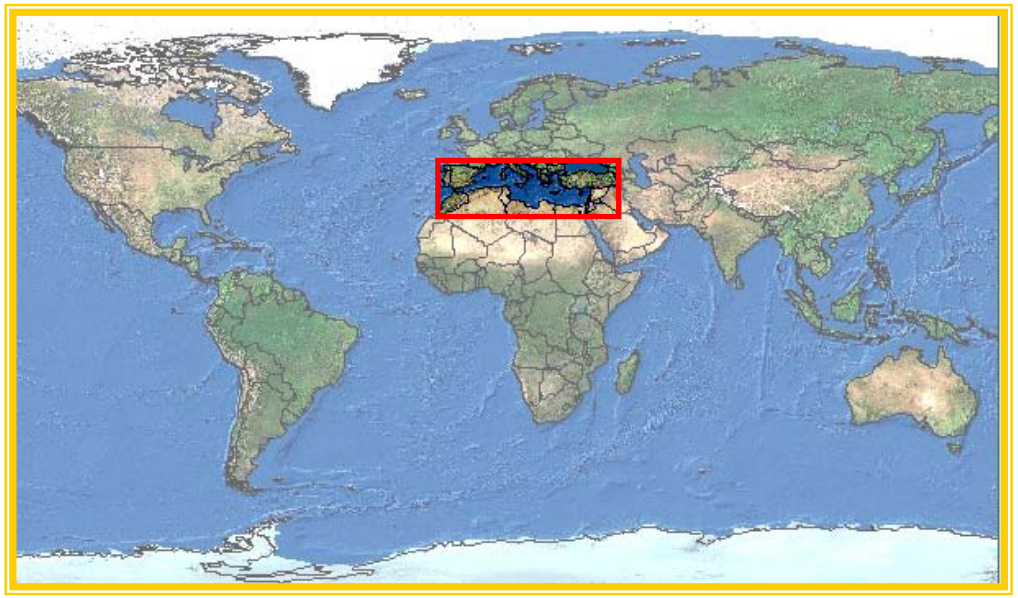
JRC Scientific and Technical Reports

Agro-meteorological Bulletin for South and East Mediterranean Countries

Issue 6 (2007)
Overview for winter crop sowing
Situation at the end of November 2007

MARS-FOOD Action
Institute for the Protection and Security of the Citizen



JRC EUROPEAN COMMISSION

EUR 23054 EN - 2007

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JRC 42139

EUR 23054 EN
ISSN 1018-5593

Luxembourg: Office for Official Publications of the European Communities

Highlights

The winter crop emerged earlier compared to last year in Algeria, and Tunisia and with significant delay in Morocco, Israel, Jordan, Palestine and eastern Libya.

Country by Country

	**Algeria**	The agro-meteorological situation for winter crop sowing during the current vegetative season is better than normal and better than in the previous year. The sowing campaign is going with advance comparing with the previous year.
	**Egypt**	The agro-meteorological situation for winter crop sowing during the current vegetative season is close to normal and close to the previous year. The sowing campaign is going like in the previous year.
	**Israel**	The agro-meteorological situation for winter crop sowing during the current vegetative season is close to normal but worse than in the previous year. The sowing campaign is going with delay comparing with the previous year.
	**Jordan**	The agro-meteorological situation for winter crop sowing during the current vegetative season is close to normal but worse than in the previous year. The sowing campaign is going with delay comparing with the previous year.
	**Lebanon**	The agro-meteorological situation for winter crop sowing during the current vegetative season is close to normal but worse than in the previous year. The sowing campaign is going with delay comparing with the previous year.
	**Libya**	The agro-meteorological situation for winter crop sowing during the current vegetative season is close to normal but worse than in the previous year. The sowing campaign in the eastern part of the country is going with delay comparing with the previous year.
	**Morocco**	The agro-meteorological situation for winter crop sowing during the current vegetative season is close to normal and better than in the previous year. However, the sowing campaign is going with delay comparing with the previous year due to delay in start of rainy season.
	**Palestine**	The agro-meteorological situation for winter crop sowing during the current vegetative season is close to normal but worse than in the previous year. The sowing campaign is going with delay comparing with the previous year.
	**Saudi Arabia**	The agro-meteorological situation for winter crop sowing during the current vegetative season is close to normal and close to the previous year. The sowing campaign is only at the beginning.
	**Syria**	The agro-meteorological situation for winter crop sowing during the current vegetative season is close to normal but worse than in the previous year. The sowing campaign is only at the beginning.
	**Tunisia**	The agro-meteorological situation for winter crop sowing during the current vegetative season is better than normal and better than in the previous year. The sowing campaign is going with advance comparing with the previous year.

The situation is detailed in the following pages.

Summary of the analysis

Meteorological conditions were favorable for winter crop sowing in Algeria, and Tunisia. In Morocco a rainy season has started only during the last dekad of November, and the conditions for winter crop sowing became favorable too. The conditions were unfavorable in other countries mainly due to moisture deficit.
The meteorological conditions in general was better than in the previous year in Algeria, Morocco, and Tunisia and worse in Israel, Jordan, Lebanon, Libya, and Syria. The conditions in other countries were close to the previous year.
Winter crop sowing campaign was likely to be in advance comparing with the previous season in Algeria, and Tunisia. The campaign has started later than in the previous year in Morocco, Jordan, Israel, and eastern Libya. Analysis of remote sensing indicators shows that winter crop not emerged at the end of November 2007 in Saudi Arabia, and Syria.
Analysis of crop growth indicators shows that winter crop status at the end of November 2007 was better than in the previous year in Algeria, and Tunisia. The crop status is likely to be close to the previous year in Egypt. The situation in other countries of the region was worse comparing with the previous year.

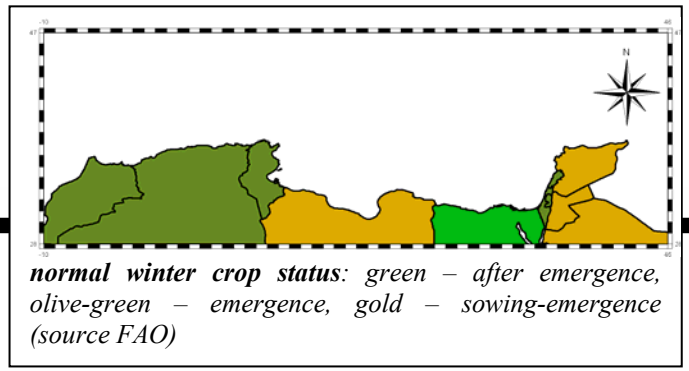
	winter crop	
	development stage	crop status (comparing with previous season)
Algeria	**emergence-tillering**	+
Egypt	**sowing-emergence**	=
Israel	**sowing-emergence**	-
Jordan	**sowing-emergence**	-
Lebanon	**sowing-emergence**	-
Libya	**sowing-emergence**	-
Morocco	**sowing-emergence**	-
Palestine	**sowing-emergence**	-
Saudi Arabia	**before sowing-sowing**	
Syria	**before sowing-sowing**	
Tunisia	**emergence-tillering**	+

Winter Crop Status

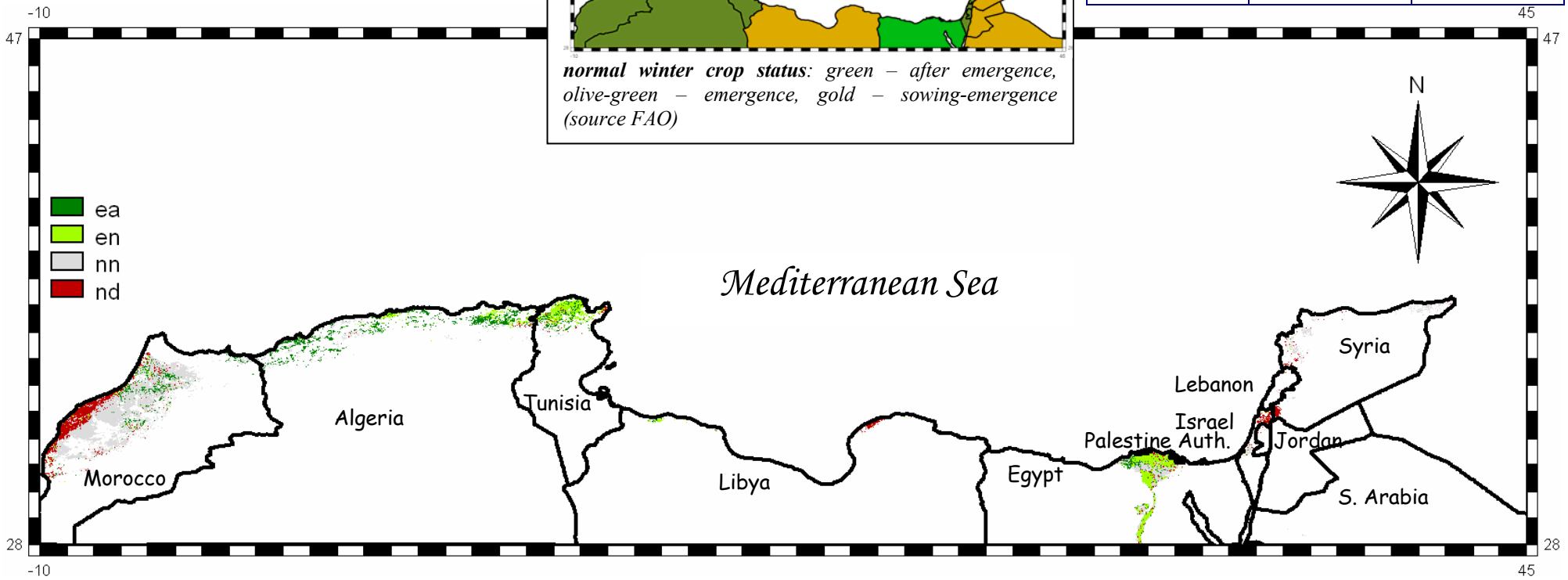
Increasing of greenness on remote sensing data within the area with winter crops can be used as an indicator of winter crop emergence. The map below and the table inform about increasing of greenness in winter crop sowing areas. Based on these data it seems possible to conclude that winter crop at the end of November was emerged almost completely in Tunisia, and Algeria. The emergence of winter crop practically was not detected for Saudi Arabia, and Syria.
Comparing the emergence data with the previous year shows big delay for Israel, Jordan, Palestine, Syria, eastern Libya, and Morocco. Big advance in winter crop emergence comparing with the previous year is observed for Algeria, and Tunisia. The situation is close to the previous year in Saudi Arabia, and Egypt.

country	area where vegetative season was started before the end of November (percent from all pixels with winter crop) for years:	
	2007	**2006**
Algeria	**75.4**	**17.5**
Egypt	**56.5**	**52.2**
Israel	**9.9**	**61.2**
Jordan	**14.5**	**74.8**
Lebanon	**21.5**	**55.1**
Libya	**42.9**	**78.2**
Morocco	**9.5**	**21.6**
Palestine Auth.	**9.8**	**85.3**
Saudi Arabia	**1.2**	**0**
Syria	**2.6**	**29.2**
Tunisia	**86.2**	**64.8**

Winter crop status at the end of November 2007:
ea – *after emergence and with advance comparing with 2006;*
en - *after emergence and close to 2006;*
nn – *before emergence and close to2006;*
nd – *before emergence and with delay comparing with 2006.*
Small map - long-term average data for October-November, source FAO.



***normal winter crop status**: green – after emergence, olive-green – emergence, gold – sowing-emergence (source FAO)*



Meteorological Indicators

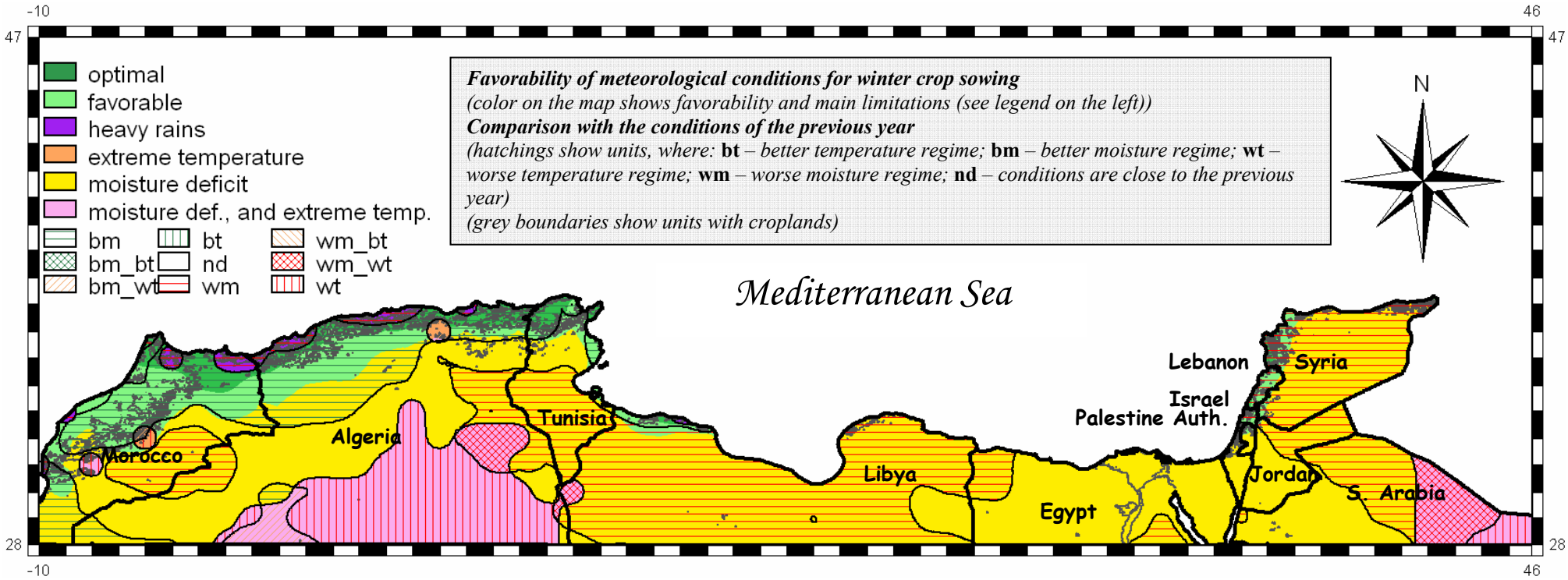
Meteorological conditions were optimal or favorable for winter crop sowing in Maghreb countries, Lebanon, and western Syria. However the situation in Morocco has became favorable only during the last dekad of November. Amount of precipitation was close to critical or below critical for winter crop sowing in other countries of the region. Extreme air temperature was observed only in some non-cropping areas. Heavy rains took place in Algeria, and eastern Morocco.

The meteorological situation in general was worse comparing with the previous year in eastern half of the region, and it was better in Maghreb countries.

The results of the analysis are summarized in the Table. The color of cells indicates the difference of meteorological conditions with the previous season (red – worse, green – better, and gray – the same).

Please, note that in some countries of the region winter crops were not started to growth at the end of November 2007.

meteorological conditions for winter crops sowing	*comparing with previous season (October-November)*
Algeria	**heavy rains**
Egypt	**moisture deficit**
Israel	**moisture deficit**
Jordan	**moisture deficit**
Lebanon	**favorable**
Libya	**moisture deficit**
Morocco	**favorable**
Palestine	**moisture deficit**
Saudi Arabia	**moisture deficit**
Syria	**moisture deficit**
Tunisia	**favorable**



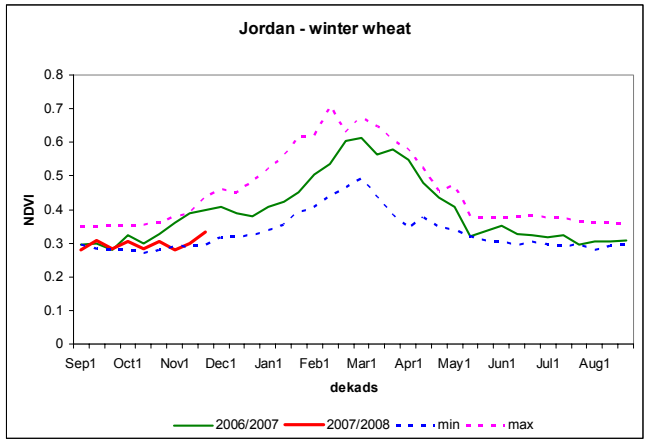
Remote Sensing Indicators

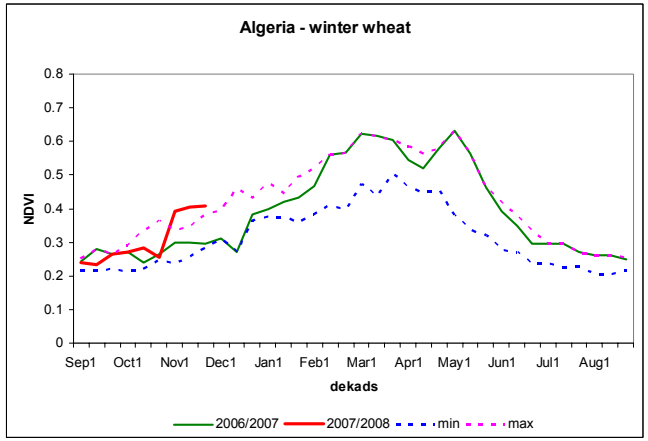
Based on the analysis of the NDVI behavior it is possible to conclude that at the end of November 2007 the situation in winter wheat producing regions of Algeria, Tunisia, and Saudi Arabia was better than in the previous year. The NDVI curves show that the winter crops status at the end of November 2007 was close to the previous year in Egypt, and it was worse than in the previous year in other countries of the region.

It is likely to be that the main reason of NDVI difference between current and previous year is delay or advance in winter crop sowing in the countries of the region.

The results of the analysis are summarized in the Table. The figures indicate year-analogue for the NDVI time profile. The color of cells indicates the difference of the indicator with the previous season (red – worse, green – better, and gray – the same).

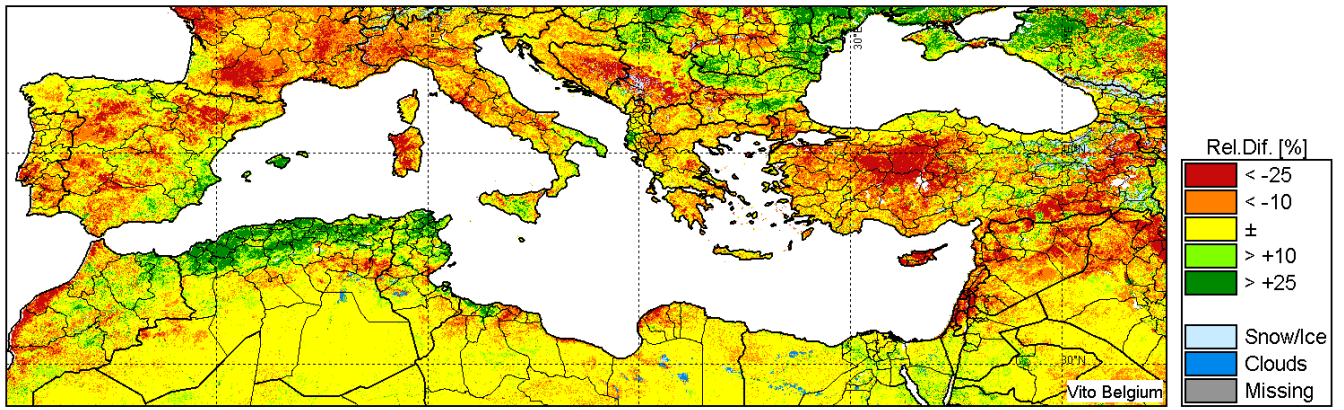
NDVI (only for areas with wheat)	**wheat**	
	NDVI comparing with previous season	analogue year
Algeria	+	**?**
Egypt	=	**2006/2007**
Israel	-	**2001/2002**
Jordan	-	**1999/2000**
Lebanon	-	**1999/2000**
Libya	-	**2002/2003**
Morocco	-	**1998/1999**
Palestine	-	**2001/2002**
Saudi Arabia		
Syria		
Tunisia	+	**2000/2001**





Examples of weighted NDVI profiles for areas with wheat and for country level ("min" and "max" are absolute extremes for the period 1999-2007)

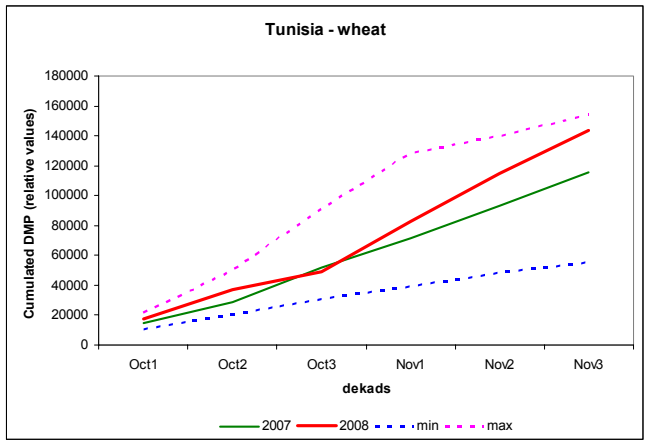
Region: Mediterranean Basin
Period: November, 2007
Theme: Normalized Difference Vegetation Index (NDVI)
Relative difference w.r.t. previous year: 100% x (Act. - Prev.)/Prev.
Source: SPOT-VEGETATION

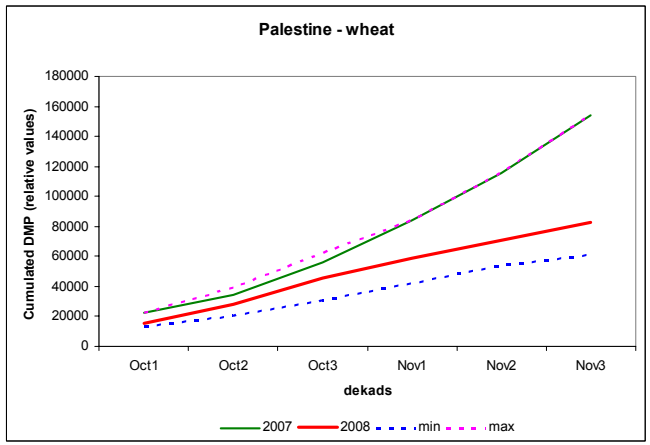


Dry Matter Production modeling

Based on the analysis of the Dry Matter Production (DMP) modeling results it is possible to conclude that at the end of November 2007 the situation in winter wheat producing regions of Algeria, Tunisia, and Saudi Arabia was better than in the previous year. The cumulated DMP curves show that the winter crops status at the end of November 2007 was close to the previous year in Egypt, and it was worse than in the previous year in other countries of the region.
The results of the analysis are summarized in the Table. The figures indicate year-analogue for the cumulated DMP time profile. The color of cells indicates the difference of the indicator with the previous season (red – worse, green – better, and gray – the same).
For many countries of the region the cumulated DMP time profile (October-November) is close to the season 2002/2003.

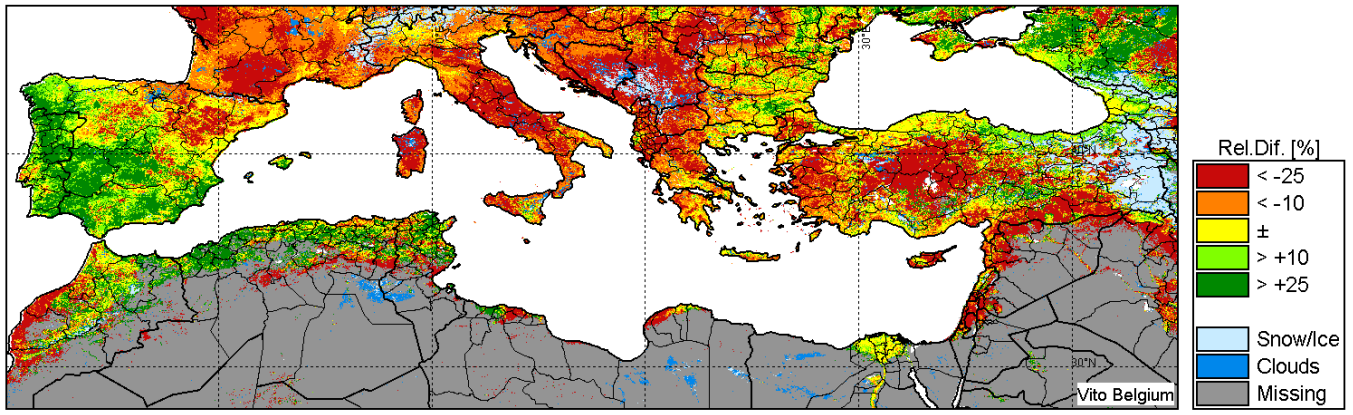
Dry matter production modeling (only for areas with wheat)	**wheat**	
	DMP comparing with previous season	analogue year
Algeria	+	**1998/1999**
Egypt	=	**2006/2007**
Israel	-	**2002/2003**
Jordan	-	**2002/2003**
Lebanon	-	**2003/2004**
Libya	-	**1998/1999**
Morocco	-	**2002/2003**
Palestine	-	**2002/2003**
Saudi Arabia		
Syria		
Tunisia	+	**2000/2001**





Examples of weighted DMP profiles for areas with wheat and for country level ("min" and "max" are absolute extremes for the period 1999-2007)

Region: Mediterranean Basin
Period: November, 2007, Dekad 3/3
Theme: Cumulative DMP over Growing Season (Oct.1 - present)
Relative difference w.r.t. previous year: 100% x (Act. - Prev.)/Prev.
Source: SPOT-VEGETATION



Background and References

The present Bulletin is dedicated to the analysis of the agro-meteorological situation in the non-European countries of the Mediterranean basin during the period from the beginning of October to the end of November 2007. This is a period for winter crops sowing, and emergence in most countries of the region. Practically in all countries, wheat and barley are the main winter crops. Additionally, sugar beets are cultivated in winter in Tunisia and Israel, as well as potatoes in Morocco. The main part of winter crops is cultivated in rain-fed conditions. In Israel, Libya and Syria about 20-30% of winter cereal crops and in Egypt and Saudi Arabia practically all crops are irrigated. The present Bulletin is devoted to the analysis of the meteorological conditions only for winter cereals.

The monitoring of the agro-meteorological situation is based on the analysis of the following dekadal data: minimal, maximal and average air temperature, sums of precipitation and global radiation, dekadal values of the climatic water balance, dekadal maps of the Normalized Difference Vegetation Indexes (NDVI), dekadal maps of the Dry Matter Production. Meteorological data are derived from the outputs of the numerical meteorological model from ECMWF (UK), and were prepared for analysis by METEOCONSULT (NL). SPOT-VEGETATION data were used as a basis for calculation of the remote sensing indicators of crop growth. Data were preprocessed by VITO (BE). After that, dekadal maximal NDVI values were weighted for pixels within which winter crops are cultivated, and then – were weighted again at country level. Thus, weighted NDVI values were used as an indicator of crop status. Dry Matter Production maps were calculated by VITO based on SPOT-VEGETATION data and information about global radiation, applying the Monteith approach.
The background information is given in the following table.

Production and Yield of Wheat in 2005 (FAOSTAT data, last accessed 01.12.2006)

Country	*Production, 1000 tons*	*Yield, t/ha*
Algeria	**2600**	**1,4**
Egypt	**8141**	**6,5**
Israel	**190**	**2,5**
Jordan	**33**	**1,4**
Lebanon	**120**	**2,6**
Libya	**125**	**0,8**
Morocco	**3043**	**1,0**
Palestine Auth.	**50**	**2,3**
Saudi Arabia	**2400**	**5,2**
Syria	**4669**	**2,5**
Tunisia	**1360**	**1,6**

Green color indicates figures, which are higher than normal and red color indicates figures, which are lower than normal.

This is a Bulletin prepared by the MARS-FOOD Action, Agriculture Unit, IPSC, Joint Research Centre, European Commission.

Acknowledgements. *The following organizations were involved in data supply: VITO (BE), METEOCONSULT (NL), ECMWF (UK).*

European Commission

EUR 23054 EN – Joint Research Centre
Title: **Agro-meteorological Bulletin for South and East Mediterranean Countries**
Author: **Savin I.**

Luxembourg: Office for Official Publications of the European Communities
2007 – 11 pp. – 31x24 cm
EUR – Scientific and Technical Research series – ISSN 1018-5593

Abstract

The Bulletin is dedicated to the analysis of the agro-meteorological situation in the non-European countries of the Mediterranean basin (Morocco, Algeria, Tunisia, Libya, Egypt, Saudi Arabia, Israel, Jordan, Palestine Auth., Lebanon and Syria) during the period from the beginning of October to the end of November 2007. The monitoring of the agro-meteorological situation is based on the analysis of the dekadal meteorological data, and maps of the Normalized Difference Vegetation Indexes. The first pages contain the main results of the analysis. The following pages are dedicated to the analysis of separate indicators of the crop growth.

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